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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
PHAM, TUAN	

ART UNIT	PAPER NUMBER
2643	

DATE MAILED: 05/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/866,525	CONROY ET AL.	
	Examiner	Art Unit	
	TUAN A PHAM	2643	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1-5, 9-11, 22-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harrington et al. (U.S. Patent No. 6,163,579, hereinafter, "Harrington") in view of Haug (U.S. Patent No. 4,881,244).

Regarding claim 1, Harrington teaches a transformer (see figure 7, transformer 410) for coupling signals between a transceiver and a transmission line (see figure 7, telephone line 20, driver 402, receiver 432), The transceiver including a driver circuit for supplying a transmit signal to the transformer and a receiver circuit for receiving a

receive signal from the transformer (see figure 7, driver 402, receiver 432, col.6, ln.10-36), the transformer comprising:

It should be noticed that Harrington fails to clearly teach a first port adapted to being coupled to the transmission line, a second port adapted to being coupled to the driver circuit, a third port adapted to being coupled to the receiver circuit, a first winding part having a turns ratio of 1: n, where n >1, and a second winding part having a turn ratio of 1: m, where m < n. However, Haug teaches such features (see figure 2, first port a3-e3, second port a1-e1, third port a1-e2, first winding part [a1-e1, a3-e3], second winding part [a1-e2, a3-e3], col.4, ln.10-52)(e.g., 1:n, where n>1, if n=2 then first winding part's ratio is n:2n=1:2, second winding part's ratio is 1:2n, where m=2n then 2n:2n=1:1) for a purpose of reducing the power consumption in a transformer used in telecommunication system.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the use of a first port adapted to being coupled to the transmission line, a second port adapted to being coupled to the driver circuit, a third port adapted to being coupled to the receiver circuit, a first winding part having a turns ratio of 1: n, where n >1, and a second winding part having a turn ratio of 1: m, where m < n, as taught by Haug, into view of Harrington in order to control the transmit and receive gain.

Regarding claims 2-4, Harrington further teaches a transformer wherein m=1, n<2m, m<(1/2)n (see col.6, ln.31-36). It should be noticed that Harrington fails to clearly teach the transformer having the turn ratio as stated above. However, Harrington

teaches the turns ratio of the transformer can be set independently, changing the value number of turns of transformer as claimed would not involve any inventive feature since it is just a matter of selecting the number of turn ratio for meeting the characteristic of the particular gain.

Regarding claim 5, Harrington teaches a line interface for coupling signals between a data transceiver and a transmission line having a load impedance Z (see col.3, ln.10-40), the line interface comprising:

a transformer (see figure 7, transformer 410),

a driver circuit for supplying a transmit signal from the data transceiver to the transformer (see figure 7, driver 402), and

a receiver circuit for receiving a receive signal from the transformer (see figure 7, receiver 432).

It should be noticed that Harrington fails to clearly teach a first port adapted to being coupled to the transmission line, a second port adapted to being coupled to the driver circuit, a third port adapted to being coupled to the receiver circuit, a first winding part having a turns ratio of 1: n, where n >1, and a second winding part having a turn ratio of 1: m, where m < n. However, Haug teaches such features (see figure 2, first port a3-e3, second port a1-e1, third port a1-e2, first winding part [a1-e1, a3-e3], second winding part [a1-e2, a3-e3], col.4, ln.10-52)(e.g., 1:n, where n>1, if n=2 then first winding part's ratio is n:2n=1:2, second winding part's ratio is 1:2n, where m=2n then 2n:2n=1:1) for a purpose of reducing the power consumption in a transformer used in telecommunication system.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the use of a first port adapted to being coupled to the transmission line, a second port adapted to being coupled to the driver circuit, a third port adapted to being coupled to the receiver circuit, a first winding part having a turns ratio of 1: n, where n >1, and a second winding part having a turn ratio of 1: m, where m < n, as taught by Haug, into view of Harrington in order to control the transmit and receive gain.

Regarding claims 9-11, Harrington further teaches a transformer wherein m=1, n<2m, m<(1/2)n (see col.6, ln.31-36). It should be noticed that Harrington fails to clearly teach the transformer having the turn ratio as stated above. However, Harrington teaches the turns ratio of the transformer can be set independently, changing the value number of turns of transformer as claimed would not involve any inventive feature since it is just a matter of selecting the number of turn ratio for meeting the characteristic of the particular gain.

Regarding claims 22 and 24, Harrington teaches an apparatus and method for coupling signals between a transceiver and a transmission line via a multi-port transformer (see figure 7, transformer 410), the transceiver including a driver circuit and a receive Circuit (see figure 7, driver 402, receiver 432), the transformer including a line port, a transmit port, and a receive port (see figure 7, line port 20, transmit port 406-408, receive port 433-434), the apparatus comprising:

means for supplying a transmit signal from the driver circuit to the transmit port of the transformer (see figure 7, driver 402, col.6, ln.1--36).

means for supplying a receive signal from the transmission line to the line port of the transformer (see figure 7, receiver 432, col.6, ln.1-36);

It should be noticed that Harrington fails to clearly teach means for providing a first path from the transmit port to the line port so as to couple the transmit signal to the transmission line, the first path having a coupling ratio of n, where n >1, and means for providing a second path from the line port to the receive port so as to couple the receive signal to the receive circuit, the second path having a coupling ratio of 1/m, where m < n. However, Haug teaches such features (see figure 2, first port a3-e3, second port a1-e1, third port a1-e2, first winding part [a1-e1, a3-e3], second winding part [a1-e2, a3-e3], col.4, ln.10-52)(e.g., 1:n, where n>1, if n=2 then first winding part's ratio is n:2n=1:2, second winding part's ratio is 1:2n, where m=2n then 2n:2n=1:1) for a purpose of reducing the power consumption in a transformer used in telecommunication system.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the use of means for providing a first path from the transmit port to the line port so as to couple the transmit signal to the transmission line, the first path having a coupling ratio of n, where n >1, and means for providing a second path from the line port to the receive port so as to couple the receive signal to the receive circuit, the second path having a coupling ratio of 1/m, where m < n, as taught by Haug, into view of Harrington in order to control the transmit and receive gain.

Regarding claims 23 and 25, Haug further teaches a transformer wherein the first path includes a first winding part of the transformer, the first winding part having a turns ratio of 1: n, and wherein the second path includes a second winding part of the transformer

the second winding part having a turns ratio of 1:m (see figure 2, first port a3-e3, second port a1-e1, third port a1-e2, first winding part [a1-e1, a3-e3], second winding part [a1-e2, a3-e3], col.4, ln.10-52)(e.g., 1:n, where n>1, if n=2 then first winding part's ratio is n:2n=1:2, second winding part's ratio is 1:2n, where m=2n then 2n:2n=1:1).

Regarding claims 26-28, Harrington further teaches a transformer wherein m=1, n<2m, m<(1/2)n (see col.6, ln.31-36). It should be noticed that Harrington fails to clearly teach the transformer having the turn ratio as stated above. However, Harrington teaches the turns ratio of the transformer can be set independently, changing the value number of turns of transformer as claimed would not involve any inventive feature since it is just a matter of selecting the number of turn ratio for meeting the characteristic of the particular gain.

3. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harrington et al. (U.S. Patent No. 6,163,579, hereinafter, "Harrington") in view of Haug (U.S. Patent No. 4,881,244) as applied to claim 5 above, and further in view of Oakley (U.S. Patent No. 6,633,642).

Regarding claim 6, Harrington and Haug, in combination, fails to clearly teach a line interface wherein the effective input impedance at the second port is Z/K2 when the

third port is open. However, Oakley teaches such features (see col.7, ln.50-67, col.8, ln.1-15) for a purpose of determining the total value impedance of the transformer.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the use of the line interface wherein the effective input impedance at the second port is Zo/K2 (where Z=Zo, n=K) when the third port is open, as taught by Oakley, into view of Harrington and Haug in order to combined impedance of the ideal transformer.

Regarding claim 7, Oakley further teaches a line interface wherein an effective input impedance at the third port is Zo/K2 (where Z=Zo, m=K) when the second port is open (see col.7, ln.18-62).

4. Claims 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harrington et al. (U.S. Patent No. 6,163,579, hereinafter, "Harrington") in view of Haug (U.S. Patent No. 4,881,244) as applied to claim 5 above, and further in view of Hayat-dawoodi (U.S. Patent No. 6,369,650).

Regarding claim 8, Harrington and Haug, in combination, fails to clearly teach a line interface wherein the receiver circuit includes a first sensing resistor having a resistance R, and a second sensing resistor having a resistance 2mR/n. However, Hayat-dawoodi teaches such features (see figure 1, sensing resistor R1, col.3, ln.40-45) for a purpose of detecting current pass through the driver.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the use of a line interface wherein the

receiver circuit includes a first sensing resistor having a resistance R, and a second sensing resistor having a resistance 2mR/n, as taught by Hayat-dawoodi, in view of Harrington and Haug in order to reduce noise in transmitting and receiving path.

5. Claims 12-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harrington et al. (U.S. Patent No. 6,163,579, hereinafter, "Harrington") in view of Haug (U.S. Patent No. 4,881,244) as applied to claims 5 above, and further in view of Gambuzza (U.S. Patent No. 6,226,331).

Regarding claim 12, Harrington and Haug, in combination, fails to clearly teach a line interface wherein the driver circuit and the receiver circuit have a single-ended circuit structure. However, Gambuzza teaches such features (see col.4, ln.55-65, col.5, ln.1-5) for a purpose of transmitting the data over communication network.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the use of a line interface wherein the driver circuit and the receiver circuit have a single-ended circuit structure, as taught by Gambuzza, into view of Harrington and Haug in order to produce the data signal in communication network.

Regarding claim 13, Gambuzza further teaches a line interface wherein the driver circuit and the receiver circuit has a differential circuit structure (see col.4, ln.55-65, col.5, ln.1-5).

Regarding claim 14, Gambuzza further teaches a line interface wherein the driver circuit and the receiver circuit includes a resistive hybrid circuit (see col.5, ln.20-40).

Regarding claim 15, Gambuzza further teaches a line interface wherein the driver circuit and the receiver circuit includes a capacitive hybrid circuit (see col.5, ln.20-40).

Regarding claim 16, Gambuzza further teaches a line interface wherein the driver circuit and the receiver circuit includes a passive hybrid circuit (see col.5, ln.20-50).

Regarding claim 17, Gambuzza further teaches a line interface wherein the line interface is adapted to an ADSL system (see col.4, ln.34-55).

Regarding claim 18, Gambuzza further teaches a line interface wherein the line driver is integrated in a single IC chip of an analog front end (see col.3, ln.45-50).

Regarding claim 19, Gambuzza further teaches a line interface wherein the receive circuit is integrated in the IC chip of the analog front end (see col.3, ln.45-50).

Regarding claim 20, Gambuzza further teaches a line interface wherein the receive circuit includes a receive signal amplifier (see col.4, ln.55-65).

Regarding claim 21, Gambuzza further teaches a line interface wherein the line driver operates with a supply voltage of about 5 V (see col.4, ln.55-65).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. In order to expedite the prosecution of this application, the applicants are also requested to consider the following references. Although Ashley et al. (U.S. Patent No. 5,528,630), Naviasky et al. (U.S. Patent No. 6,608,860), Chaplik (U.S. Patent No. 6,400,772), and Consi (U.S. Patent No. 5,838,722) are not applied into this Office Action; they are also called to Applicants attention. They may be used in future Office Action(s). These references are also concerned for supporting the system and method for detecting an impedance mismatch between a transceiver and transmission line.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Tuan A. Pham** whose telephone number is (703) 305-4987. The examiner can normally be reached on Monday through Friday, 8:00 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Curtis Kuntz can be reached on (703) 305-4708 and

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Art Unit 2643

March 7, 2004

Examiner

Tuan Pham

CURTIS KUNTZ
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